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EXPERIMENTAL INVESTIGATION OF RETARDED INSTABILITY  
TURBULENT BOUNDARY LAYER (U) CROWDER, UNGER, STANLEY  
INST DE MECANIQUE C BINDER DEC 87 DAJA45-87-C-0013

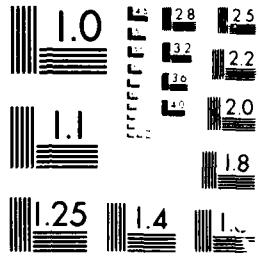
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MICROLOGY RESOLUTION TEST CHART  
MANUFACTURED BY MICROLOGY CORPORATION

AD-A191 354

EXPERIMENTAL INVESTIGATION OF RETARDED  
UNSTEADY TURBULENT BOUNDARY LAYERS

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by

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ASSOCIATION POUR LE DEVELOPPEMENT DE LA RECHERCHE  
Institut de Mécanique de Grenoble

Contract No. DAJA 45-87-C-0015

2nd Period Report  
September 1987 - December 1987

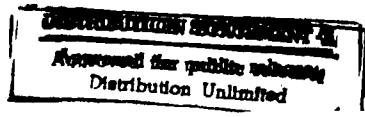
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## PROGRESS REPORT

The work done during the four months period of the contract was essentially ~~still~~ devoted to modifying and improving the apparatus for the measurements to be performed under this contract, in particular:

1. the test section of the flow loop. The reinforcement of diffusor plates and the provisions for easy insert of wall hot film gages have been finished. The flow facility is ready to run.
2. carriage for displacement of hot film probes : construction is in progress. Most parts have been delivered.
3. Small jet facility for in-situ calibration of X-hot wire probes : construction by the laboratory shop is in progress.
4. instrumentation : a technique of mounting TSI miniature hot film probes has been developed. This sensor has been tested and its performance compared to that of the DISA sensors previously used. The emission optics of the home-made laser Doppler anemometer have also been improved to facilitate measurements.
5. data acquisition : an OLIVETTI M-240 micro-computer (640 K core memory, 20 M byte hard disk) has been selected and ordered. Delivery is promised for end of December (a one month delay with respect to original delivery schedule). For analog or digital data acquisition the interface purchased is from "ANALOG DEVICES". It has the following capabilities : multiplexing of 8 channels, zero shift, amplification, A/D conversion (32 kHz), 24 digital I/O.

→ Keywords Turbulent Boundary layer  
Turbulent Flow Boundary layer

## RESEARCH PLANS

The last preliminary tasks required before the measurements can begin are :

1. to write the software for the OLIVETTI M 240 and ANALOG DEVICES interface data acquisition and processing system

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2. to develop a procedure for rapid simultaneous calibration of four hot film probes.

It is expected that the actual measurements can begin in about two months. This system will, of course greatly improve the efficiency of the data collection as well as the reliability of the data.

The following measurements will then be carried out

- wall-shear stress measurements with hot film gages by varying
  - . the X-position
  - . the oscillation frequency and amplitude
  - . the diffusor angle
- velocity measurements of  $u$ ,  $u$ ,  $u'$  with LDA in some of the above condition.

ANNEX

Unused funds remaining on the contract at the end  
of period covered by the report :

NONE

END

DATE

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